

**REMARKS**

Claims 1-3 and 5-25 are pending in the application and are at issue.

Claims 1-25 stand rejected under 35 U.S.C. §112, second paragraph as being indefinite because the term "partially" is a relative term. Applicants traverse this rejection. It also should be noted that, for this and all other rejections, claim 4 previously was cancelled and that claims 1-3 and 5-25 are pending in the application.

Independent claims 1 and 22 recite that the hydroxy-terminated oligoester is a partially branched oligoester that is the reaction product of diols, saturated dicarboxylic acids, and one or more saturated triols or polyols at a level of up to 5 mole % of the oligoester. The term "partially branched oligoester" therefore is not merely a relative term. The independent claims clearly and definitely set forth the amount of branching by reciting the amount of triol or polyol present in the oligoester. It is submitted therefore that all claims fully comply with 35 U.S.C. §112, second paragraph, and that the rejection should be withdrawn.

Claims 1-3 and 5-25 stand rejected under 35 U.S.C. §103 as being unpatentable over McBain et al. U.S. Patent No. 5,777,053 ('053) in view of Bristow et al. U.S. Patent No. 4,213,837 ('837). Applicants respectfully traverse this rejection.

Applicants' present claims recite a *partially branched* aliphatic hydroxy-terminated oligoester as a component of the urethane acrylate gel coat resin. In contrast, the '053 patent discloses only *linear* aliphatic polyester intermediates "made from aliphatic dicarboxylic acids or aliphatic anhydrides and glycols" ('053 patent specification, column 2, lines 37-39). Specific glycols and diols are disclosed at column 2, lines 49-55, of the '053 patent. The '053 patent fails to teach or suggest using a triol or polyol to form a partially-branched oligoester, either in the specification, including the examples, or the claims.

After reading the '053 patent, a person skilled in the art would have had no incentive to alter the explicit teachings of the reference and provide a partially-branched oligoester as recited in the present claims.

Notably, the '837 patent, like the '053 patent, merely discloses *linear* hydroxy-terminated polyester oligomers, designated as BAHPO. The BAHPO of the '837 patent is disclosed in the structure at column 3, lines 21-37, which clearly depicts a compound having *two* hydroxy groups, i.e., a diol as opposed to a triol or polyol. The '837 patent therefore fails to teach or suggest a BAHPO that would yield a partially-branched oligoester, as presently claimed.

The Office Action asserts that the "term 'polyol' is commonly known in the art to encompass di-functional alcohols, such as diols." This contention is incorrect.

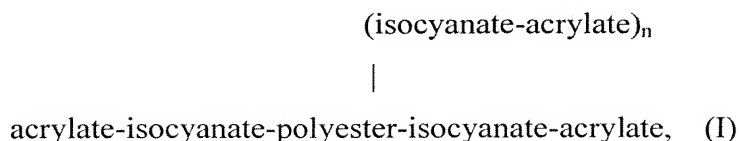
Applicants provide a definition of "polyol" in Exhibit A, submitted concurrently with this response. The definition clearly states that a polyol is defined as a compound containing *three* or more hydroxy groups, thereby excluding diols that include, and are limited, to two hydroxy groups. Accordingly, the Office Action's reasoning for upholding the obvious rejection over a combination of the '053 and '837 patents is incorrect.

In summary, the present claims recite a urethane acrylate gel coat resin having a partially branched hydroxy-terminated aliphatic oligoester as a component. Partial branching is achieved by preparing the oligoester using up to 5 mole % of one or more triol or polyol. Neither the '053 patent nor the '837 patent teaches or suggests such a partially branched polyester component, and both references are directed solely to linear polyesters. Because the combination of references fails to teach each claimed feature, and because a person skilled in the art would have had no incentive to modify the combined teachings of the references from a linear polyester to a partially branched polyester, the rejection of pending claims 1-3 and 5-25 over a combination of the '053 and '837 patents under 35 U.S.C. §103 cannot be sustained and should be withdrawn.

Claims 1-3 and 5-25 stand rejected under 35 U.S.C. §103 as being obvious over a combination of Tomotsugu et al. U.S. Patent No. 5,338,613 ('613) in view of the '837 patent. The Office Action relies upon the '613 patent for disclosing a urethane acrylate resin prepared from a hydroxy-functional polyester, a polyisocyanate, and 2-hydroxyethyl (meth)acrylate. The polyester is prepared from a mixture of 60-100% diol and 0-40% triol. The Office Action relies upon the '837 patent, as in the above rejection, for teaching a method

of producing a polyester urethane acrylate. The Office Action then asserts that it would have been obvious to combine the '613 and '837 patents and arrive at the presently claimed invention. Applicants traverse this rejection.

The '613 patent discloses that "[t]wo processes are available for synthesizing a urethane acrylate resin" (column 2, lines 64-65). In one process, a urethane acrylate resin is prepared by first providing a polyester ('613 patent, column 2, lines 20-63), which then is reacted with an aliphatic or alicyclic polyisocyanate "to prepare an isocyanate-terminated urethane prepolymer" ('613 patent, column 2, line 66 through column 3, line 9). Then, "by utilizing the residual isocyanate groups of the urethane prepolymer", a 2-hydroxyethyl (meth)acrylate is added ('613 patent, column 3, lines 9-13). An alternative method of preparing the urethane acrylate resin is disclosed at column 3, lines 14-18 of the '663 patent, i.e., addition of 2-isocianoethyl (meth)acrylic to the terminal hydroxyl group of the polyester. By *either* method, the '613 patent teaches a urethane acrylate resin having the following general structure:



wherein n is 0 if triols and polyols are omitted and n is 1 or greater if a triol or a polyol is present.

This method is *exactly* the same method disclosed in the '053 patent cited against the claims, i.e., and previously traversed in Amendment "A".

In contrast to both the '613 patent and the previously traversed '053 patent, the present claims recite a polyester urethane acrylate reaction mixture that is prepared by a substantially different method, and which provides different reaction products to the method disclosed in the '613 and '053 patents, even *if the same* reactants are used. As stated above, the '613 and '053 patents each disclose a polyurethane acrylate resin made by preparing an isocyanate-terminated polyurethane prepolymer, *then* reacting the prepolymer with a hydroxyalkyl acrylate to form the urethane resin.

The differences between a present polyester urethane acrylate reaction mixture and a coating composition of the '053 patent is fully set forth in Amendment "A" at pages 9-11. The present polyester urethane acrylates differ from the urethane acrylic resin of the '613 patent for the same reasons set forth at pages 9-11, Amendment "A", which applicants incorporate herein by reference. Based on the method by which the compound is prepared and the stoichiometry of the reaction, the '613 patent teaches that a resin of formula (I) is essentially the only reaction product made. In contrast, the present gel coat resin is made *via* a different process and yields a composition *comprising* (i) a partially branched compound of structural formula (I) wherein  $n > 0$ , (ii) a compound of structure formula (I) wherein  $n = 0$ , *and* (iii) *other* compounds, such as acrylate-isocyanate-acrylate, that simply are present if the ingredients are reacted according to the method of the '613 patent.

In addition, the '613 patent provides no teaching or suggestion to prepare a presently claimed reaction mixture by completely rearranging the two processes disclosed therein. The '613 patent discloses no problems with the disclosed methods, or the resulting resin, that would lead a person skilled in the art to even consider altering the method or composition of the '613 patent and arrive at the presently claimed gel coat composition. There is simply no apparent reason provided in the teachings or suggestions of the '613 patent that would lead a person skilled in the art to modify the '613 patent and arrive at the presently claimed invention.

The '837 patent does not overcome the deficiencies of the primary '613 patent. The Office Action relies upon the '837 patent to support a contention of obviousness because the '837 reference discloses three alternative methods of making polyester urethane acrylates (column 5, line 48 through column 6, line 26). The examiner states that a preferred method of the '837 patent "allows for a better control of the exothermic reaction, and minimizes the formation of by-products".

First, the '837 patent is directed to *aromatic* polymers based on bisphenol A. The present claims, and the '613 patent, are directed to *aliphatic* polymers. The control of exotherms and avoidance of by-products referred to in the '837 patent is particularly relevant to aromatic polymers, and such a teaching is not necessarily extendable to aliphatic polymers. For example, it is well known that aliphatic hydroxy groups (e.g., alcohols) and aromatic

hydroxy groups (e.g. phenols) can undergo different reactions and via different mechanisms, and can undergo similar reactions differently.

The '837 patent explicitly teaches that the different blending techniques disclosed in the '837 patent to prepare the polymer provide a difference in reaction products, i.e., by-product formation is affected. Therefore, contrary to the Patent Office's assertion that the primary '613 patent teaches the same polymer as presently claimed, even though made by a different process, the '837 patent teaches that the polymer production process *does* yield different reaction products (column 6, lines 17-26). The '837 patent also teaches that different processes may require "greater care in selecting the amounts of components" (column 6, lines 24-26), which further shows that blending techniques affect the reaction product.

A person skilled in the art would have had no apparent reason to modify the teachings of the '613 patent by using the production method of the '837 patent. The '613 patent provides a specific method of preparing an aliphatic urethane acrylate resin. The '837 patent discloses alternative methods of preparing an aromatic acrylate urethane resin. A person skilled in the art simply would not consider using a method of the '837 patent to prepare a resin of the '613 patent because control of an exothermic is not an issue, and the reaction product would be different, without any predictable benefit.

With respect to claims 13-15, note that the claimed oligoester comprises adipic acid. The '613 patent specifically states that the "acid component of the polyester to be employed in the present invention is *exclusively* an alicyclic dicarboxylic acid" (column 2, lines 26-28). The '613 patent therefore clearly teaches away from claim 13, wherein the polyester contains a linear dicarboxylic acid.

In summary, the '837 patent is directed to linear, aromatic polymers, and methods of preparing aromatic polymers are not necessarily the same as methods of the preparing aliphatic polymers. The '837 patent further teaches that different processes for preparing a polymer results in a different reaction product, which contradicts a contention that the order of addition of reactants does not yield different product mixtures. Applicants


therefore respectfully submit claims 1-3 and 5-25 are patentable over a combination of the '613 and '837 patents, and that the rejection should be withdrawn.

It is submitted that all claims are in a form and scope for allowance. An early and favorable action on the merits is respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, the examiner is urged to telephone the undersigned at the indicated number

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Respectfully submitted,

By 

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